



Nevada Bioassessment Program Statewide & on the Truckee River

**Nevada Division of Environmental
Protection**

Bureau of Water Quality Planning

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Where is the State at with their Bioassessment Program?

❖ **Monitor Main Stems, Tribs and 1 & 2nd Order Streams**

- **2000**

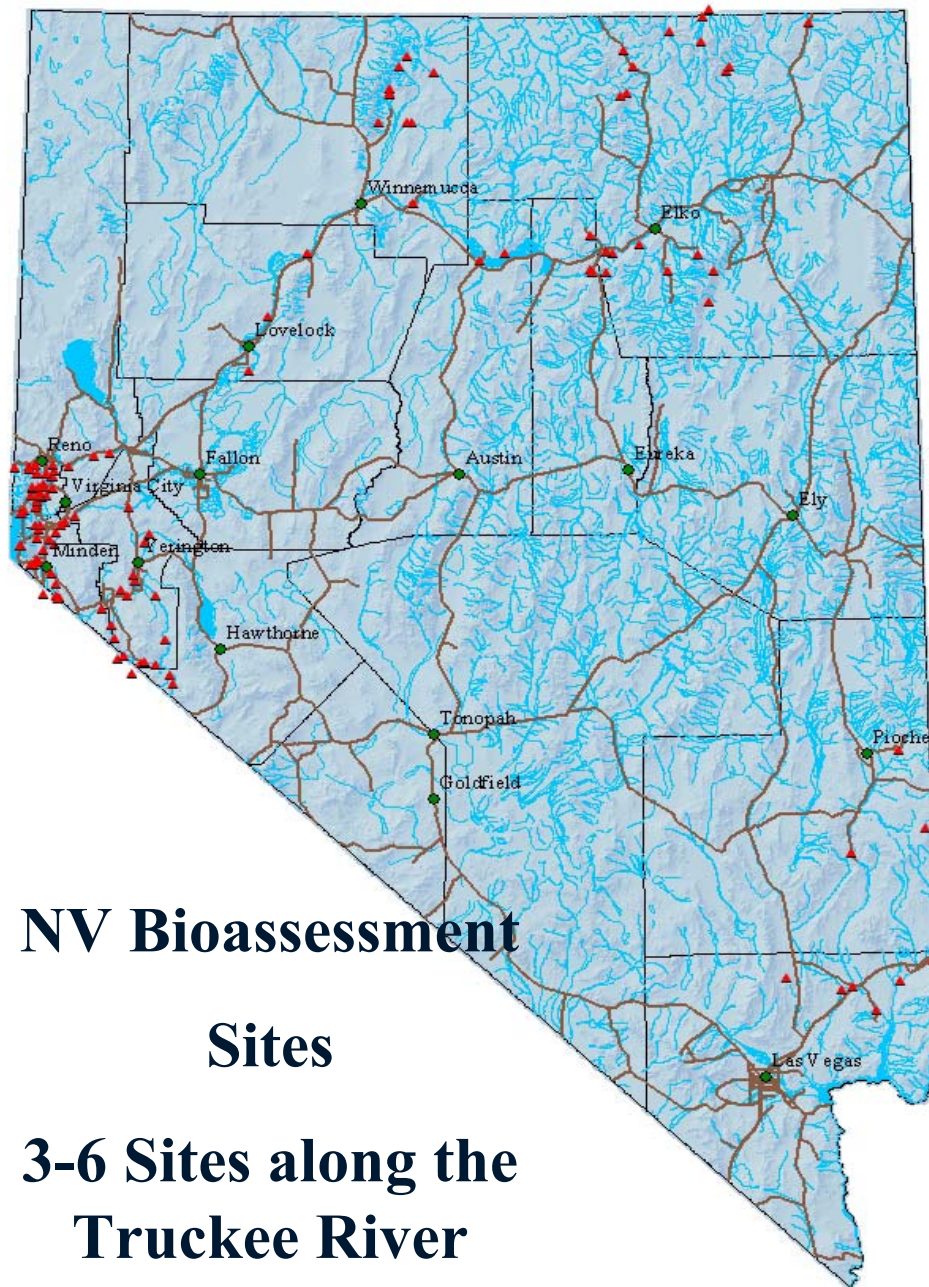
- **Walker, Carson, Steamboat and Truckee River Basins**

- **2001: Added**

- **Virgin & Muddy River Basins**

- **2002: Added**

- **Tahoe, Snake & Humboldt Basins**



Parameters for Bioassessment Monitoring

- **Macroinvertebrates**
 - **Adopted from California/EPA Protocols (3 riffles)**
 - **Physical Habitat Evaluations – Qualitative Rating-10 Questions (Bank Stability, Vegetation Protection, Epifaunal Substrate etc.)**
- **Physical Parameters**
 - **Flow, Riffle Velocity, Slope, DO, pH, %Canopy, %cobble, gravel, etc., %Embeddness (sediment), vegetation types, etc.**

Other Monitoring Parameters that May be Taken

- **Water Chemistry**
 - **Nutrients, Metals & Bact-T**
- **Periphyton: 2002 Only**
 - **Tahoe, Steamboat, Walker,
Carson, Snake & Humboldt
Basins**

Determination of Sampling Sites

- **Physical Attributes**
 - **Elevation, Canyon vs. Valley Floor, etc.**
- **Major Land Use Changes**
 - **Urban vs. Rural, etc.**
- **Access**
- **River Reaches defined under the NAC**
- **Coordination with other Agency Sampling Sites**

Goals/Objectives of Program

- **Determine & Define the Aquatic Health of our Water Ways**
- **Determine if Physical/Chemical Attributes are relevant to changes in the Biological Assemblages and Aquatic Health**
 - **Stratify with Filters: Ecoregions, Elevation, Slope, Water Chemistry etc.**
- **Develop baseline data for all major water basins in the State**
 - **3 Years at a majority of Sites**
 - **Assess Natural Variation Occurring**

Goals/Objectives (cont)

- **Develop Rotational Basin Monitoring Plan**
 - **Continue Adding new Sites**
 - **>20 new Sites a year**
 - **Estimate 150 Samples per Year**
Maximum for Routine Monitoring on a Rotational Basis
 - **Monitoring Plan is under Development**

Goals/Objectives (cont)

- **Develop Criteria and Selection of Reference Conditions and Sites**
 - **Determine Least Disturbed Sites**
 - **Develop Metrics/Index's or Model for Reference Sites for comparison to routine sites**
 - **Assess Aquatic Health**
 - **Determine if Aquatic Life Use is being met**
 - **Other Uses may be defined in the process (e.g. habitat, chemistry)**

Goals/Objectives (cont)

- **EPA Office of Research and Development will be working with the State on Reference Conditions/Sites**
 - **Intensive (EMAP Protocols) sampling for Reference Sites/Physical Habitat**
 - **Collect Additional Data from other Agencies (e.g. fisheries, chemistry)**

What Happens Once Reference Sites/Criteria are Determined??

(Goals/Objectives Cont)

- **Development of Index's or Models to Compare with Routine Sites**
 - **Index of Biological Integrity (IBI)**
 - Fishery, Periphyton, Macro's
 - **Index of Physical Habitat**
 - Vegetation cover, embeddness, slope, sinuosity etc.
 - **Development of Tiered Aquatic Life Uses**

Tiered Aquatic Life Uses

- Information Obtained through the Index's can be used to establish ***Tiered Aquatic Life Uses (TALU)***
 - Based on a set of 6 tiers along a gradient of biological conditions from Pristine to Severely Degraded
 - Nationally Under Development (EPA, States/Tribes) and being used by several states

Tiered Aquatic Life Uses (cont)

- Tiers 1 & 2 meet the **CWA Biological Integrity Objective**
- Tiers 3 & 4 meet the **Interim Goal of the CWA**
(e.g. Fisherable/Swimmable)
- Tiers 5 & 6 are **Degraded Systems**
(Tier 6 is close to Dead or Dying)

Tiered Aquatic Life Uses

Maine Example

- **Tier 1: Abbreviated Criteria**

➤ ***“Native structural, functional and taxonomic integrity is preserved; ecosystem function is preserved within the range of natural variability”***

Tiered Aquatic Life Uses Maine Example

- **Tier 1: Very Abbreviated Guidance**
 - **Historically Documented, sensitive, long lived, or regionally endemic taxa (Fish)**
 - **Sensitive Rare Taxa Present by a certain proportion (macro's)**
 - **Densities, Tolerant, Intolerant, anomalies, etc. (fish, macro, peri etc.)**
 - **Non-native allowed only if there is no inconsequential effect on native biota**
 - **Detrimental effects are limited to storms, fire, etc. (relates to PHAB conditions and Ecosystem Function)**

Tiered Aquatic Life Uses

Maine Example

- Tier 3

➤ ***“Some changes in structure due to loss of some rare native taxa; shifts in relative abundance of taxa but Sensitive-ubiquitous taxa are common and abundant; ecosystem functions are fully maintained through redundant attributes of the system”***

Tiered Aquatic Life Uses Maine Example

- **Tier 3: Very Abbreviated Guidance**
 - **Historically documented, sensitive endemic taxa are uncommon (fish)**
 - **Some replacement of Sensitive-rare Taxa (macro's)**
 - **Increases temperature/nutrients results in increase algae mats**
 - **Tolerant Taxa increases**
 - **Anomalies are low but tumors are absent**
 - **Quality is sufficient to fully support reproduction of most long-lived species**

How is ALL this Related to the Truckee River???

- **State Pilot Project on the Truckee to develop IBI's and TALU's**
 - **Has overall, the most data collected in State**
 - **Test appropriateness, feasibility and usefulness of IBI's to assess Aquatic Health**
- **Stateline to the Reservation**
- **Work with Tribe and other agencies (NDOW, USF&W, TMWRF, etc.) and other Consulting and Research Groups**

Proposed Truckee River Pilot Project

- **Development of IBI's for:**
 - **Fishery**
 - **Periphyton**
 - **Macro's**
 - **Habitat Index (?)**
- **Development of Tiered ALU's**

Proposed Truckee River Pilot Project

- **Testing of the Methods (IBI)**
 - **How well does it work? Is it Feasible?**
- **Development of Guidelines for determining Aquatic Health/Integrity for the Truckee**
- **State Reporting required under the CWA 305(b) & 303(d)**
- **The Guidelines could eventually be incorporated into WQS for the Truckee River**

Recap of Truckee River Pilot Project

- **To Determine/Assess the Aquatic Health of the Truckee River**
Physical Habitat, Periphyton, Fishery, Macroinvertebrates
- **IBI's are Diagnostic Tools**
 - Project will develop and define the tools
- **This is a PILOT PROJECT to look at the NV portion of the river: Stateline to the Reservation**
- **Estimated Time Period: Several Years**